

We Claim:

- Sub #27
1. A thermoelectric module comprised of:
    - A) a plurality of n-legs comprised of very thin alternating layers of silicon and silicon carbide; and
    - B) a plurality of p-legs,;said p-legs and said n-legs being electrically connected to produce said thermoelectric module.
  2. A thermoelectric module as in Claim 1 wherein said p-legs comprise very thin alternating layers of boron carbide.
  3. A thermoelectric module as in Claim 2 wherein said very thin alternating layers of boron carbide comprise two different stoichiometric forms of boron carbide.
  4. A thermoelectric module as in Claim 3 wherein said very thin alternating layers of boron carbide are alternating layers of  $B_4C$  and  $B_{10}C$ .
  5. A thermoelectric module as in Claim 2, wherein said plurality of n-legs is comprised of a plurality of very thin alternating layers of silicon and silicon carbide and said very thin alternating layers of boron carbide are alternating layers of  $B_4C$  and  $B_{10}C$ .
  6. A thermoelectric module as in Claim 1 wherein said alternating layers are deposited on a substrate.
  7. A thermoelectric module as in Claim 6 wherein said substrate is silicon
  8. A thermoelectric module as in Claim 6 wherein said substrate is silicon film.
  9. A thermoelectric module as in Claim 6 wherein said substrate is a polyimide substrate.
  10. A thermoelectric element as in Claim 9, wherein said polyimide substrate is Kapton®.
  11. A thermoelectric element as in Claim 10, wherein said polyimide substrate is Kapton® film.
  12. A thermoelectric element as in Claim 1, wherein said very thin alternating layers are each less than 100nm thick.
  13. A thermoelectric element as in Claim 1 wherein said very thin alternating layers are each about 10 nm thick.

14. A thermoelectric element as in Claim 9 wherein said plurality of very thin alternating layers is at least 1250 layers.

14. A thermoelectric element as in Claim 9 wherein said plurality of very thin alternating layers is at least 1250 layers.